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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Heng Tsai, et al.

Serial No: 10/583,179

Filed: June 16, 2006

Title: PROTEIN SEPARATION DEVICE

Docket No: 490352-3004

Group Art Unit: 2161

Examiner:

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

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*[Signature]*  
KJ Rostor

*2/20/07*  
Date

**INFORMATION DISCLOSURE STATEMENT**

Sir:

Pursuant to 37 C.F.R. § 1.56, § 1.97 and § 1.98, Applicant brings the references listed on the attached Form PTO-1449 to the examiner's attention. These references may be material to examination of the above-identified application. Please do not construe the filing of this information disclosure statement as a representation that applicant has made a search (37 C.F.R. § 1.97(g)), or as an admission that the information cited is, or is considered to be, material to patentability, or that no other material information exists.

This Information Disclosure Statement is being submitted:

- ☒ 1. Within three months of the filing date of a national application other than a continued prosecution application under 37 CFR 1.53(d), or within three months of the date of entry of the national stage as set forth in 37 CFR 1.491 in an international application; or before the mailing date of a first office action on the merits, or before the mailing of a first office action after filing of a request for continued examination under 37 CFR 1.114, and therefore, Applicant believes no fee is required;
- ☐ 2. After the period specified in paragraph (1) hereinabove of this section, but is being filed before the mailing date of either a final action under 37 CFR 1.113, or a notice of

allowance under 37 CFR 1.311, or an action that otherwise closes prosecution in the application, and is accompanied by one of the following:

- ☐ (a) A statement that either:
- (i) Each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement;

OR

- (ii) No item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the statement after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement;

OR

- ☐ (b) The fee of \$180 for filing of an Information Disclosure Statement as set forth in 37 C.F.R. 1.17(p).

- ☐ 3. After the period specified in paragraph (2) of this section, but is filed on or before payment of the issue fee and is accompanied by both:

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OR

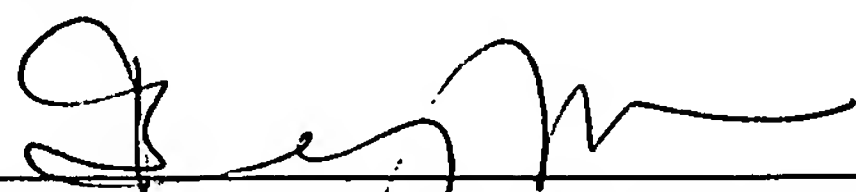
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- ☐ (b) The fee of \$180.00 for filing of an Information Disclosure Statement as set forth in 37 CFR 1.17(p).

Applicant would appreciate the Examiner initialing and signing a copy of Form PTO-1449, transmitted herewith, indicating that the information has been considered and made of record herein.

In the unlikely event that the transmittal letter is separated from this document and the Patent Office determines that an extension and/or other relief is required, Applicant petitions for any required relief including extensions of time and authorizes the Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to **Deposit Account No. 50-1901** referencing order number 490352-3004.

Respectfully submitted,

By   
Barbara A. Wrigley, Reg. No. 34,950  
Customer No. 34205  
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**Complete if Known**

**(Use as many sheets as necessary)**

Sheet	1	of	4
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Application Number	PCT/SG2004/000417
Filing Date	December 17, 2004
First Named Inventor	Heng Hang TSAI et al.
Art Unit	not assigned yet
Examiner Name	not assigned yet
Attorney Docket Number	490352-3004/US

[illegible]

FOREIGN PATENT DOCUMENTS						
Examiner Initials *	Cite No. <sup>1</sup>	Foreign Patent Document	Publication Date	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages Or Relevant Figures Appear	T <sup>6</sup>
		Country Code <sup>3</sup> Number <sup>4</sup> Kind Code <sup>5</sup> (if known)	MM-DD-YYYY			
	B1	WO 2002/083725, A1	10-24-2002	RNA INC. et al.		<input type="checkbox"/>
	B2	WO 2003/048783, A1	06-12-2003	POSTON ROBIN		<input type="checkbox"/>
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This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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Substitute for form 1449/PTO  <b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b> <i>(Use as many sheets as necessary)</i>		<b>Complete if Known</b>	
		Application Number	PCT/SG2004/000417
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		First Named Inventor	Hen Hang TSAI et al.
		Art Unit	not yet assigned
		Examiner Name	not yet assigned
Sheet 2	of 4	Attorney Docket Number	490352-3004/US

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials *	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, pages, volume-issue number(s), publisher, city and /or country where published.	T <sup>2</sup>
	C1	AGARD, D.A., "To fold or not to fold", Science, (1993) p. 1903-1904, Vol. 260.	<input type="checkbox"/>
	C2	ALTSCHUL, S.F., et al., "Basic Local Alignment Search Tool", J. Mol. Biol., (1990) p. 403-410, Vol. 215.	<input type="checkbox"/>
	C3	AUSUBEL, et al. (eds), Current Protocols in Molecular Biology, (1989) p. 2.10.3, Vol. 1, Green Publishing Associates, Inc. and John Wiley & Sons, Inc., New York.	<input type="checkbox"/>
	C4	BHUTANI, N., et al., "Chaperonins as protein-folding machines", Current Science, (2002) p. 1337-1351, Vol. 83, No. 11.	<input type="checkbox"/>
	C5	BRAZIL, B.T., et al., "Model Peptide Studies Demonstrate That Amphipathic Secondary Structures Can Be Recognized by the Chaperonin GroEL (cpn60)", J. Biol. Chem., (1997) p. 5105-5111, Vol. 272, No. 8.	<input type="checkbox"/>
	C6	BUKAU, B., et al., "The Hsp70 and Hsp60 Chaperone Machines", Cell, (1998) p. 351-366, Vol. 92.	<input type="checkbox"/>
	C7	CHATELLIER, J., et al., "GroEL Recognises Sequential and Non-sequential Linear Structural Motifs Compatible with Extended $\beta$ -Strands and $\alpha$ -Helices", J. Mol. Biol., (1999) p. 163-172, Vol. 292.	<input type="checkbox"/>
	C8	CHAUDHURI, T.K., et al., "GroEL/GroES-Mediated Folding of a Protein Too Large to Be Encapsulated", Cell, (2001) p. 235-246, Vol. 107.	<input type="checkbox"/>
	C9	DebBURMAN, S.K., et al., "Chaperone-supervised conversion of prion protein to its protease-resistant form", Proc. Natl. Acad. Sci. U.S.A., (1997) p. 13938-13943, Vol. 94, No. 25.	<input type="checkbox"/>
	C10	ERBSE, A., et al., "A folding machine for many but a master of none", Nature Structural Biology, (2003) p. 84-86, Vol. 10, No. 2.	<input type="checkbox"/>
	C11	GÉMINARD, et al., "Characteristics of the interaction between Hsc70 and the transferrin receptor in exosomes released during reticulocyte maturation", J. Biological Chem., (2001) p. 9910-9916, Vol. 276.	<input type="checkbox"/>
	C12	HARTL, F.U., et al., "Molecular Chaperones in the Cytosol: from Nascent Chain to Folded Protein", Science, (2002) p.1852-1858, Vol. 295.	<input type="checkbox"/>
	C13	HEMMINGSEN, S.M., "What is a chaperonin?", Nature, (1992) p. 650, Vol. 357, No. 6380.	<input type="checkbox"/>
	C14	HOURLY, W.A., "Mechanism of substrate recognition by the chaperonin GroEL", Biochem. Cell Biol., (2001) p. 569-577, Vol. 79, © 2001 NRC Canada.	<input type="checkbox"/>

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		Filing Date	December 17, 2004
		First Named Inventor	Hen Hang TSAI et al.
		Art Unit	not yet assigned
		Examiner Name	not yet assigned
Sheet 3	of 4	Attorney Docket Number	490352-3004/US

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials *	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, pages, volume-issue number(s), publisher, city and /or country where published.	T <sup>2</sup>
	C15	HYNES, et al., "Individual subunits of the eukaryotic cytosolic chaperonin mediate interactions with binding sites located on subdomains of $\beta$ -actin", J. Biological Chem., (2000) p. 18965-18994, Vol. 275.	<input type="checkbox"/>
	C16	KINBARA, K., et al., "RAS GTPases: INTEGRINS' FRIENDS OR FOES?", Nature Reviews: Molecular Cell Biology, (2003) p. 767-776, Vol. 4.	<input type="checkbox"/>
	C17	KLUMPP, M., et al., "Structure of the Substrate Binding Domain of the Thermosome, an Archaeal Group II Chaperonin", Cell, (1997) p. 263-270, Vol. 91.	<input type="checkbox"/>
	C18	NADEAU, et al., "Hsp90 chaperonins possess ATPase activity and bind heat shock transcription factors and peptidyl propyl isomerases", J. Biological Chem., (1993) p. 1479-1487, Vol. 268.	<input type="checkbox"/>
	C19	NAM, et al., "Affinity Purification and characterization of the Escherichia coli molecular chaperones", Protein Expression and Purification, (2002) p. 282-291, Vol. 24.	<input type="checkbox"/>
	C20	NEEDLEMAN, et al., "A General Method Applicable to the Search for Similarities in the Amino Acid Sequence of Two Proteins", J. Mol. Biol., (1970) p. 443-453, Vol. 48.	<input type="checkbox"/>
	C21	NIELSEN, K.L., et al., "A Single-Ring Mitochondrial Chaperonin (Hsp60-Hsp10) Can Substitute for GroEL-GroES In Vivo", Journal of Bacteriology, (1999) p. 5871-5875, Vol. 181, No. 18.	<input type="checkbox"/>
	C22	PEARSON, W.R., et al., "Improved tools for biological sequence comparison", Proc. Natl. Acad. Sci. USA, (1988) p. 2444-2448, Vol. 85.	<input type="checkbox"/>
	C23	SAKIKAWA, C., et al., "On the Maximum Size of Proteins to Stay and Fold in the Cavity of GroEL underneath GroES", J. Biol. Chem., (1999) p. 21251-21256, Vol. 274, No. 30, Issue of July 23.	<input type="checkbox"/>
	C24	SEALE, J.W., et al., "Preformed GroES Oligomers Are Not Required as Functional Cochaperonins", Journal of Protein Chemistry, (1997) p. 661-668, Vol. 16, No. 7.	<input type="checkbox"/>
	C25	SMITH, et al., "Comparison of Biosequences", Adv. Appl. Math., (1981) p. 482-489, Vol. 2.	<input type="checkbox"/>
	C26	STANIFORD, R.A., et al., "The stability and hydrophobicity of cytosolic and mitochondrial malate dehydrogenases and their relation to chaperonin-assisted folding", FEBS Letters, (1994) p. 129-135, Vol. 344.	<input type="checkbox"/>
	C27	STRAUB, et al., "Genotyping Cryptosporidium parvum with an hsp 70 single-nucleotide polymorphism microarray", Applied and Environmental Microbiology, (2002) p. 1817-1826, Vol. 68.	<input type="checkbox"/>
	C28	TAGUCHI, H., et al., "Single-molecule observation of protein-protein interactions in the chaperonin system", Nature Biotechnology, (2001) p. 861-865, Vol. 19.	<input type="checkbox"/>

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	C29	TELL, et al. "Comparison of four rapid DNA extraction techniques for conventional polymerase chain reaction testing of three mycobacterium spp. that affects birds", Avian Diseases, (Oct. 2003) p. 1486-1490, Vol. 47.	<input type="checkbox"/>
	C30	TIJSSEN, "Overview of principles of hybridization and the strategy of nucleic acid probe assays", Laboratory Techniques in Biochemistry and Molecular Biology -- Hybridization with Nucleic Acid Probes, (1993) Part I, Chapter 2, Elsevier, New York.	<input type="checkbox"/>
	C31	WANG, Z., et al., "Basis of Substrate Binding by the Chaperonin GroEL", Biochem., (1999) p. 12537-12546, Vol. 38.	<input type="checkbox"/>
	C32	XU, Z., et al., "The crystal structure of the asymmetric GroEL-GroES-(ADP) <sub>7</sub> chaperonin complex", Nature, (1997) p. 741-750, Vol. 388.	<input type="checkbox"/>
	C33		<input type="checkbox"/>
	C34		<input type="checkbox"/>
	C35		<input type="checkbox"/>
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	C40		<input type="checkbox"/>
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